

ABSTRACT OF THE DISCLOSURE

A tunneling charge injector for use with a MOS floating gate nonvolatile memory cell includes a conducting injector electrode, a grid insulator disposed adjacent the conducting injector electrode, a grid electrode disposed adjacent the grid insulator, a retention insulator which may employ a graded band gap disposed adjacent the grid electrode, and a floating gate disposed adjacent said retention insulator. The floating gate of the tunneling charge injector is coupled to or forms a part of the floating gate of the nonvolatile memory element. Charge is injected from the conducting injector electrode onto the floating gate. Electrons are injected onto the floating gate when the conducting injector electrode is negatively biased with respect to the grid electrode; holes are injected onto the floating gate when the conducting injector electrode is positively biased with respect to the grid electrode.